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GSA Annual Meeting in Indianapolis, Indiana, USA - 2018

Paper No. 109-12

Presentation Time: 9:00 AM-6:30 PM

SEDIMENT TRANSPORT AND DEPOSITION IN FISHERCAP LAKE AND THE SWIFTCURRENT VALLEY, GLACIER NATIONAL PARK, MONTANA, USA

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In alpine valley systems with paternoster lakes, lake sediment cores reflect both changing environmental conditions and the complexities of spatial sediment transport and deposition. A sequence of lakes within two major valleys in the Many Glacier region of Glacier National Park, Montana, have multiple sediment sources which include glacial erosion, hillslope processes, and fluvial transport between lakes. We focus on a downlake transect of cores from Fishercap Lake in the Swiftcurrent Valley to better understand sediment transport and records of environmental change in the basin. Additionally, we measured suspended sediment concentrations as well as acquired bathymetric data from Fishercap and Red Rock lakes, which provide preliminary insights into sediment sources and sinks within the valley.

Fishercap Lake is relatively shallow (~1 m) and uniform in depth, with a slightly deeper upvalley region containing a greater accumulation of organic material. Fine sediment accumulation in the lake is generally massive, with organic content averaging 15%. There is a dense gravel layer below the sediment-water interface that appears to be uniform across the basin, suggesting past desiccation of the lake. The fine-grained sediment above the gravel is thickest at the upvalley end of the lake (85 cm) and grades to 40 cm at the downvalley end of the lake. Preliminary total suspended solids (TSS) data show TSS is higher at the outlets than at the inlets of Red Rock and Fishercap lakes, suggesting that the lakes are not currently efficient sediment traps and may be sources of material for Swiftcurrent Lake. Comparison of sediment concentrations from Swiftcurrent and Grinnell valleys suggests that Swiftcurrent Valley transports more sediment than Grinnell Valley into Swiftcurrent Lake. This has implications for our interpretations of climate and environmental change from cores that receive sediment and water from both valleys.

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Monday, 5 November 2018: 9:00 AM-6:30 PM

Halls J-K (Indiana Convention Center)

Geological Society of America *Abstracts with Programs*. Vol. 50, No. 6
doi: 10.1130/abs/2018AM-321580

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